

Title 15 - Mississippi State Department of Health

Part III – Office of Health Protection

Subpart 77 – On-site Wastewater

CHAPTER 03 REGULATION GOVERNING RESIDENTIAL INDIVIDUAL ON-SITE WASTEWATER DISPOSAL SYSTEMS: SOIL AND SITE EVALUATION

100 PURPOSE

The purpose of this regulation is to establish standards regarding the methods and techniques used in determining site characteristics and limitations. The soil information such as texture, structure, landscape position, color and seasonal water table depths, will determine the treatment and disposal system to be installed, constructed and approved by the Department.

101 AUTHORITY

The State Board of Health is authorized to promulgate these rules under and by virtue of Section **41-3-15(1)(b)(ii), (4)(a)(b)(c)(e)(h)(i)**, Section **41-3-17** and Section **41-67-1** through **41-67-39, Mississippi Code of 1972, Annotated.**

102 INTRODUCTION

This Soil and Site Evaluation method will be used by Environmentalists/Certified Professional Evaluators for the design of all Individual On-site Wastewater Disposal Systems. The specific design criteria is outlined in the *Mississippi State Department of Health's (MSDH) – Design Standards I-XIII* and the *United States Environmental Protection Agency's (EPA) – On-site Wastewater Treatment Systems Manual EPA/625/R-00/008*. **Note:** The evaluation is understood to begin at the Natural Ground Surface.

103 DEFINITIONS

103.01 Applicant – an owner, lessee, or developer.

103.02 Available Space – the area necessary for the system and space allowance for future expansion, repair or replacement.

103.03 Board – the Mississippi State Board of Health. Section **41-67-2(c)**

103.04 Department – the Mississippi State Department of Health. Section **41-67-2(h)**

- 103.05 Drainage way – a course or channel along which water moves in draining an area, *United States Department of Agriculture, National Resource Conservation Service, Glossary of Landform and Geologic Terms*.
- 103.06 Department of Environmental Quality – the Mississippi Department of Environmental Quality (MDEQ), Office of Pollution Control.
- 103.07 Flooding – the temporary covering of the soil surface by flowing water from any source, such as streams overflowing their banks, runoff from adjacent or surrounding slopes, inflow from high tides, or any combination of sources. The frequency of the event determines the limitation assigned to each category.
1. Rare: Flooding unlikely but possible under unusual weather conditions; 1 to 5 percent chance of flooding in any year or 1 to 5 times in 100 years. (Slight limitations; includes: None or no chance of flooding).
 2. Occasional: Flooding occurs infrequently under usual weather conditions; 5 to 50 percent chance of flooding in any year or more than 5 to 50 times in 100 years. (Moderate limitations.)
 3. Frequent: Flooding is likely to occur often under usual weather conditions more than a 50 percent chance of flooding in any year or more than 50 times in 100 years, but less than a 50 percent chance of flooding in all months in any year. (Severe limitations.)
 4. Very Frequent: Flooding is likely to occur very often under usual weather conditions with a more than a 50 percent chance of flooding in all months of any year. (Extreme limitations.)
- 103.08 Flood-prone Area – an area that is generally subject to being flooded 50 times in 100 years or greater than a 50 percent chance in any year. This definition refers to an area that is subject to frequent flooding as observed, or as indicated by soil characteristics defined in the standards of the *National Soil Survey Handbook, United States Department of Agriculture*.
- 103.09 Fragipan – A dense, natural subsurface layer of hard soil with relatively slow permeability to water, mostly because of its extreme density or compactness rather than its high clay content or cementation.
- 103.10 Generator – any person whose act or process produces sewage or other material suitable for disposal in an Individual On-site Wastewater Disposal System. Section **41-67-2(i)**.
- 103.11 High Shrink Swell Soils (H3S) – soils that have relatively high clay content and a dominant mineral type that causes significant swelling when wet and shrinking when dry.

- 103.12 Hydric Soils – soils that formed under conditions of saturation, flooding or ponding long enough to develop anaerobic conditions in the upper part.
- 103.13 Impervious – resistant to penetration by air, water, and roots.
- 103.14 Maximum Flexibility – the latitude of judgment to be used by the Department to recommend all applicable wastewater disposal systems in compliance with statutes, regulations and rules of the State of Mississippi.
- 103.15 Munsell Soil Color Chart – a color space standard that specifies colors based on 3 color dimensions: hue, value (lightness) and chroma (color purity).
- 103.16 Natural Ground Surface – the more or less naturally occurring surface of the earth which has not been significantly altered or disturbed by artificial means such as cutting and/or filling (does not include plowing for agricultural purposes). Except where severely eroded, the ground surface normally begins with a dark, organic matter enriched layer (topsoil) of varying thickness followed usually with a brighter colored layer (subsoil) increasing with clay content with depth.
- 103.17 Permeability – a qualitative estimate of the relative ease with which soil transmits water.
- 103.18 Person – any individual, trust, firm, joint-stock company, public or private corporation (including a government corporation), partnership, association, state, or any agency or institution thereof, municipality, commission, political subdivision of a state or any interstate body, and includes any officer or governing or managing body of any municipality, political subdivision, or the United States or any officer or employee thereof. Section **41-67-2(m)**.
- 103.19 Ponding – standing water in a depression that is removed only by percolation, evaporation, and/or transpiration that lasts greater than 7 days.
- 103.20 Redoximorphic Features - a color pattern in a soil due to loss (depletion) or gain (concentration) of pigment compared to the matrix color, formed by oxidation/reduction of Fe (iron) and/or Mn (manganese) coupled with their removal, translocation, or accrual; or a soil matrix color controlled by the presence of Fe+2. *Field Book for Describing and Sampling Soils, NRCS, USDA*.
- 103.21 Restrictive Horizon/Layer (Water Movement) – a layer in the soil more than 3 inches thick that significantly retards the downward movement of water or hinders acceptable treatment and renovation of effluent. A restrictive horizon/layer generally has Redoximorphic Features associated with it, at least in the upper part of the restrictive layer, as well as in the horizon above it.
- 103.22 Saturation – wetness characterized by 0 positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

- 103.23 Seasonal High Water Table – the water table that is part of a discontinuous saturated zone in a soil, as indicated in the Munsell Soil Color Chart, by a value of 5 or more and a chroma 2 or less (Munsell Soil Color Chart) Redoximorphic Feature.
- 103.24 Sensitive Water – public or private waters used for recreation (swimming, skiing, fishing), shellfish harvesting, potable water intake or other situations where people are likely to come into contact.
- 103.25 Slope – deviation of a plane surface from the horizontal; when given in percent, it is the rise or fall of the land surface in feet per 100 feet of horizontal distance (i.e. linear, concave and convex)
- 103.26 Soil – a medium used to filter effluent from an Individual On-site Wastewater Disposal System in order to remove bacterium, nutrients, and viruses. The ideal medium is 25 percent water, 25 percent air, 45 percent mineral and 5 percent organic matter.
- 103.27 Soil Auger – a short cylinder with a cutting edge attached to a rod and handle.
- 103.28 Soil and Site Evaluation – the evaluation to determine if a property can support an Individual On-Site Wastewater Disposal System by use of a soil auger to a depth up to 5 feet to determine the soil texture, color, mottling and seasonal water table.
- 103.29 Soil Horizon – a layer of soil approximately parallel to the land surface and differing from adjacent genetically related layers in physical, chemical, and biological properties or characteristics including but not limited to color, structure, texture, consistence and Ph.
- 103.30 Soil Profile – a description of a soil horizon based on depth, texture, color, and mottles resulting in the correlation of the seasonal water table and restrictive horizon. This refers to Soil Horizons O, A, E, B, C and R.
- 103.31 Soil Resource Map – a general representation. **Note:** Figure I
- 103.32 Soil Texture – the numerical proportion (percent by weight) of sand, silt, and clay in a soil, *United States Department of Agriculture (USDA)*.
- 103.33 Soil Mapping Unit – a soil series based on texture of the surface Soil Horizon. Examples include: SME – Smithdale sandy loam 12 to 17 percent, SbA – Savannah loam, 0 to 2 percent slopes
- 103.34 Soil Wetness – conditions caused by Seasonal High Water Table, tidal water, seasonally saturated soils or by lateral water movement determined by identifying colors of chroma 2 or less (Munsell Soil Color Chart) in Redoximorphic Features.

- 103.35 Texture Class – standardized terms used to convey textural makeup of the fine-earth fraction less than 2 *millimeters* in diameter. The fine earth fraction includes sand (2.0 - 0.05*mm* in size), silt (0.05*mm* - 0.002*mm* in size) and clay (less than 0.002*mm* in size) particles, *United States Department of Agriculture (USDA)*. **Note:** Figure II
- 103.36 Topography – The relative position and elevations of the natural or manmade features of an area that describe the configuration of its surface (i.e., hilly, rolling, level, steep, severe, moderate, etc.).
- 103.37 Vertical Separation – the vertical separation between the bottom of the trench and a restrictive layer/horizon or Water Table.
- 103.38 Water Table – the highest part of the soil or underlying rock that is wholly saturated with water. In some places an upper or Seasonal High Water Table may be separated from a lower one by a dry zone.

104 SOIL AND SITE EVALUATION METHOD

Prior to construction of any dwelling or placement of any mobile, modular, or permanently constructed residence which may require the installation of an Individual On-site Wastewater Disposal System, the Applicant shall submit a signed Notice of Intent to the Department.

104.01 Criteria

1. Absence of Frequent Flooding;
2. Landscape position;
3. Drainage way;
4. Slope (topography);
5. Depth to seasonal water table (chroma 2 or less) in inches;
6. Depth (inches) to restrictive Soil Horizon (i.e., bedrock, fragipan, plinthite, etc.);
7. Soil texture, Munsell Soil Color Chart, and depth (inches) of Soil Horizons;
8. Setbacks
 - a. Residence, property line, or other external structures
 - b. Water supply
 - c. Sensitive Waters

9. Available Space.

104.02 Texture-by-Feel Analysis, *United States Department of Agriculture, Natural Resource Conservation Service*

The soil determination will be made based on soil borings to a depth up to 5 feet or to a depth sufficient to reach a restrictive Soil Horizon. Restrictive soil or site conditions may preclude the use of any Individual On-site Wastewater Disposal System.

The Soil Profile is recorded in inches on the Soil Profile Sheet by indicating the following:

1. Natural Ground Surface (0 inches)
2. Depth of each Soil Horizon with:
 - a. The Soil Texture. **Note:** Figure II
 - b. The Munsell Soil Color Chart (moist soil conditions.)
 - c. Seasonal High Water Table indicator, if applicable:
 - i. Seasonal High Water Table indicators may be determined by the presence of colors of chroma 2 or less (Munsell Soil Color Chart) at ≥ 2 percent of soil volume in mottles or matrix of a Soil Horizon.
 - ii. Seasonal High Water Table indicator may be determined by the indication of redoximorphic features at ≥ 2 percent of soil volume of a Soil Horizon in accordance with methods in the *Field Book for Describing and Sampling Soils*, NRCS, USDA. This procedure shall take precedence over the Sub item (a) of this Section. The Field Book is hereby incorporated by reference, including any subsequent amendments and editions.
 - iii. Another method to determine Seasonal Water Table indicators is outlined in Section 104.03.
 - d. Restrictive Horizon depth, if applicable.

104.03 Soil Wetness

1. Monitoring Well Procedure
 - a. The Applicant shall request the opportunity to monitor the site where the Individual On-site Wastewater Disposal System is to be located.

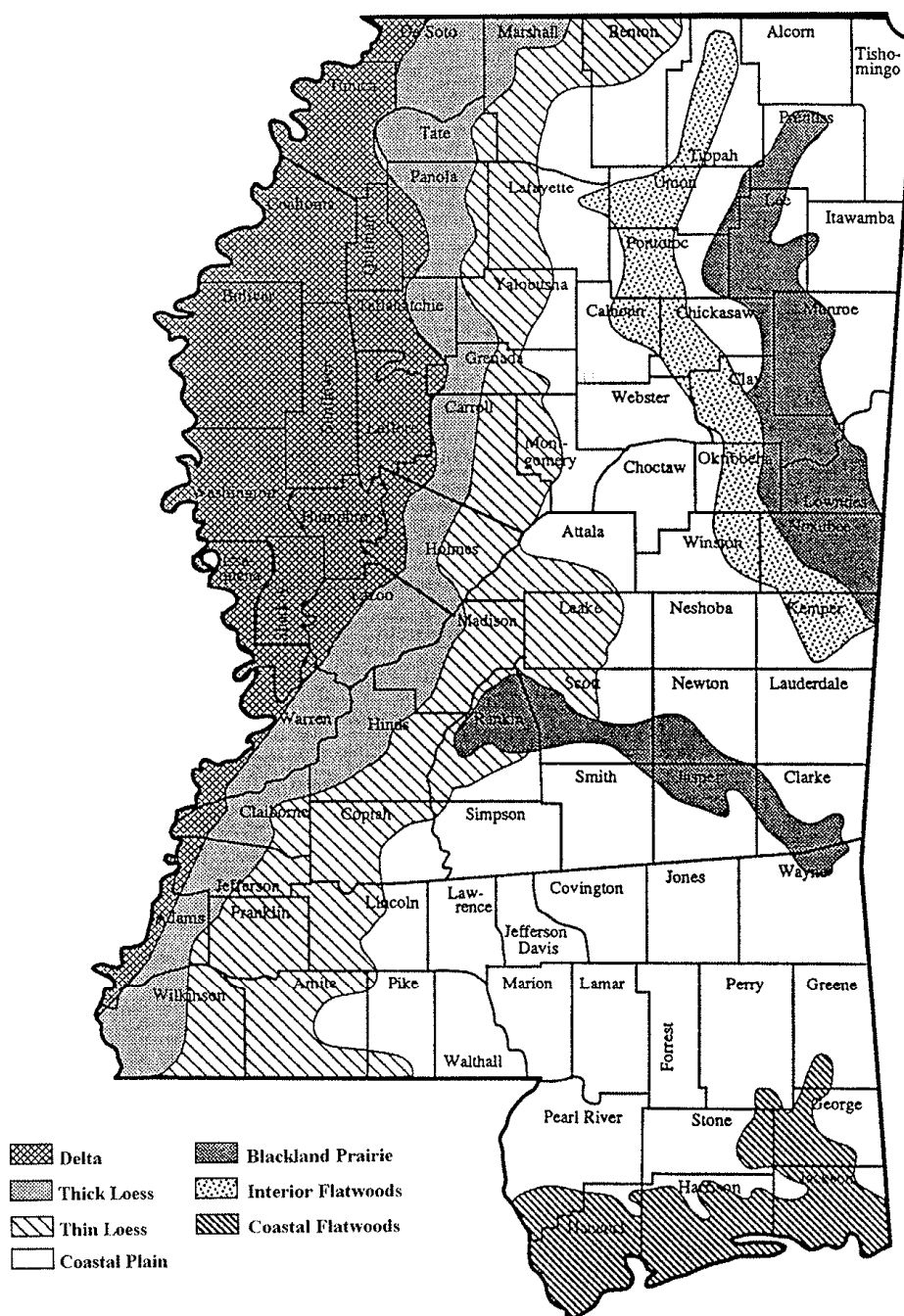
The monitoring location shall be no greater than 50 feet from the proposed Individual On-site Wastewater Disposal System.

- b. This determination shall take precedence over the determination made pursuant to the Field Evaluation Procedures Section 104.02(2)(c) of this Regulation, when the conditions of this Regulation are met.
- c. Soil wetness conditions may be determined by direct observation of the water surface in wells during periods of typically high water elevations utilizing the following monitoring procedures and interpretation method.
- d. The Applicant shall request the Division of the intent to monitor water surface elevations by submitting a method of testing that includes a site plan, well and soil profile at each monitoring location, and a monitoring plan no later than 30 days prior to the monitoring period. This consideration for monitoring shall be requested prior to monitoring and within the traditionally wet season. An Applicant other than the property owner shall have written authorization from the owner to be the owner's legal representative. Soil wetness and rainfall monitoring shall be conducted under the responsible charge of a Certified Professional Evaluator, an Engineer licensed in the State of Mississippi. The Applicant shall submit the name(s) of the consultant(s) performing any monitoring on their behalf to the Division.
- e. The Applicant shall submit a plat showing proposed sites for wastewater system, shall provide the longitude and latitude of the site, location of monitoring wells, and all drainage features that may influence the Soil Wetness conditions, and specify any proposed fill and drainage modifications.
- f. The Applicant shall submit a monitoring plan indicating the proposed number, installation depth, screening depth, soil and well profile, materials and installation procedures for each monitoring well, and proposed method of analysis. A minimum of 3 water level monitoring wells shall be installed for water surface observation at each site. For each additional 600 gallons per day, an additional well shall be required.
- g. The Division shall be given the opportunity to conduct a site visit and verify the appropriateness of the proposed plan. Well locations shall include portions of the initial and replacement area disposal site(s) containing the most limiting soil and site conditions. Prior to installation of the wells the Division shall approve the plan. If the plan is disapproved, the Division shall include specific changes necessary for approval of the monitoring plan.

- h. Wells shall extend at least 5 feet below the natural soil surface. However, wells which extend down 40 inches may be used, if they provide a continuous record of the water table for at least half of the monitoring period. One or more shallower wells may be required on sites where shallow lateral water movement or Soil Wetness conditions are anticipated.
- i. Water surface in the monitoring wells shall be recorded at least daily from **December 1 to March 31**, taken at the same time during the day (plus or minus 3 hours). A rain (precipitation) gauge is required on the site. At least daily rainfall shall be recorded beginning no later than **November 1 through December 1**.
- j. A report of the investigations made for the Monitoring Procedure shall be prepared and submitted prior to approval of the Soil Wetness condition determination by the Department. Reports prepared by a Certified Professional Evaluator bearing his/her seal must include who conducted the investigation. A request for technical review of the report by the Department shall include digital copies of monitoring data and digital copies of model inputs, output data, and graphic results, as applicable. The Department has the right to deny (void) or not accept the report based on erroneous, incomplete or false claims made by the evaluator.

Figure I

Soil Resource Areas of Mississippi



United States Department of Agriculture, Generalized Soil Map

Figure II

Texture-by-Feel Analysis

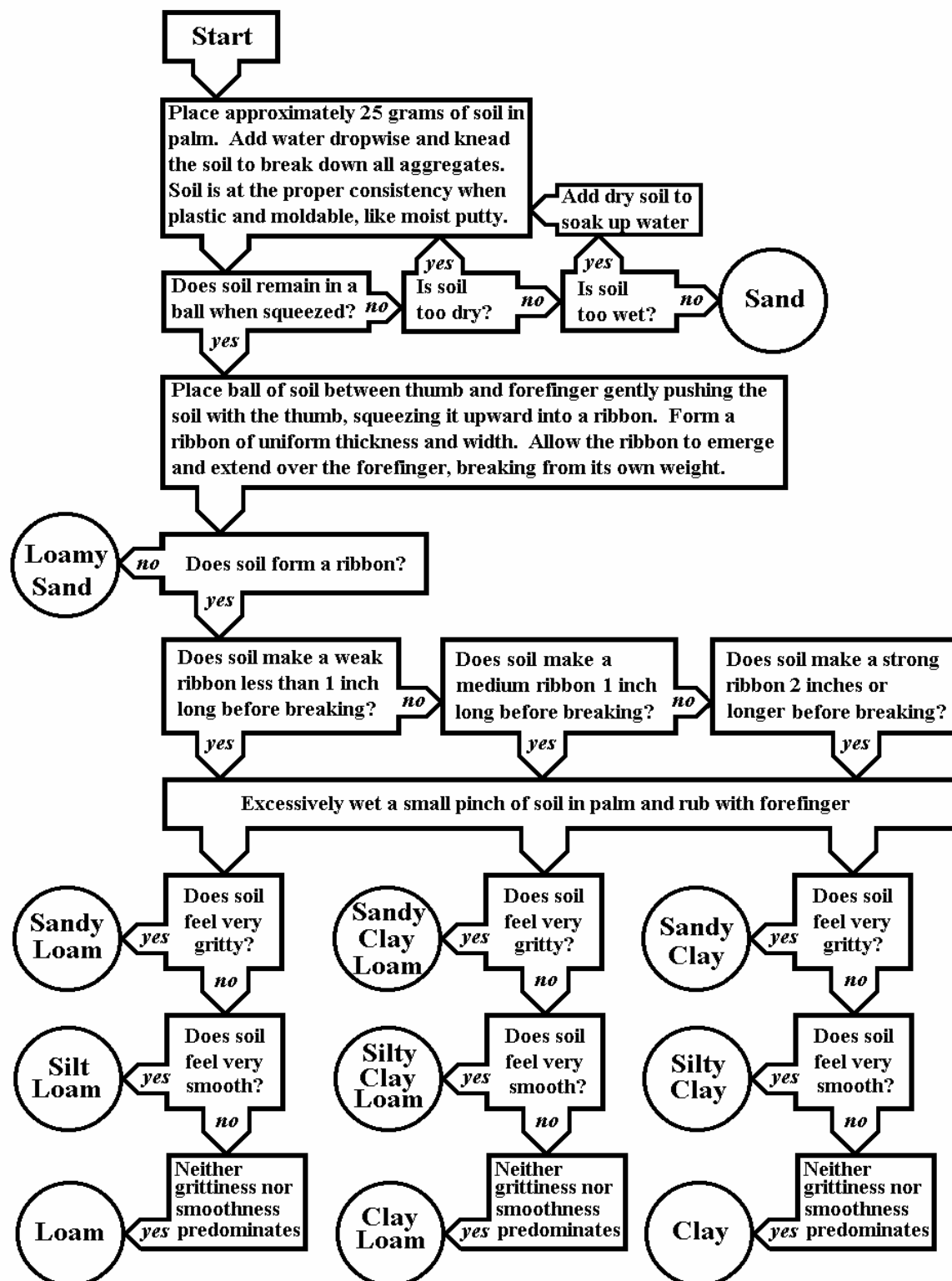


Figure III

Texture Class triangle

